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Profile of heavy metals in some medicinal plants from Ghana commonly used as components of herbal formulations

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ABSTRACT

The levels of some heavy metals in 27 medicinal plant species from Ghana were studied in order to evaluate their health implications. These plant species, especially those used in the treatment of diseases such as hypertension, diabetes and asthma may require long term usage. The metals were copper, zinc, iron, manganese, nickel and cadmium. Atomic Absorption Spectrophotometry (wet digestion) was used for the analyses, and content of metals per sample was expressed as percent g/g. Daily total intake of these metals is discussed based on the recommended daily intake of the medicinal plants or their corresponding formulations. From the results of the study zinc, copper and cadmium were present in all the plant species examined. Manganese was present in all species except V. amygdalina. Iron was found in all except five species (82%), whilst nickel was (rather rare) detected in only eight (30%) of the plant species. Significant variations in metal content existed ($P<0.05$) among the medicinal plant species with respect to the heavy metals evaluated. The concentrations of copper, zinc, cadmium and manganese were within their respective maximum permissible daily levels. However, some species, especially Ocimum canum (8), Clausena anisata and Rauwolfia vomitoria had levels of iron higher than the maximum permissible level of 1000 g/day and may require care to avoid iron toxicity. The results also highlighted the differences in contents of minerals in Lippia multiflora obtained from different locations in Ghana. The findings generally suggest that the use of these plant species for the management of diseases will not cause heavy metal toxicity and may be beneficial to the users in cases of micronutrient deficiency, as these metals were found to be present in readily bioavailable form.

KEYWORDS

Health implications . heavy metals . herbal formulations . medicinal plant

REFERENCES